Notes on the genus *Cratystylis* (Asteraceae), including one new species

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Abstract

Wilson, Paul G. & Albrecht, D.E. Notes on the genus *Cratystylis* (Asteraceae), including one new species. *Nuytsia* 14(3): 445–452 (2002). A review of the genus *Cratystylis* S. Moore is presented. One new species, *C. centralis* Albr. & Paul G. Wilson, from the Northern Territory is described, a putative hybrid, *C. conocephala* x *C. microphylla*, is noted, and a key to all taxa is provided. The results of an examination of the type material associated with the names *Cratystylis microphylla* S. Moore and *Stera microphylla* Ewart & B. Rees are detailed, and the former name lectotypified. A lectotype is also chosen for *C. conocephala* (F. Muell.) S. Moore.

Introduction

The tribal position of the Australian genus *Cratystylis* S. Moore within the Asteraceae is unclear but a placement in the subfamily Cichorioideae was suggested by Anderberg *et al.* (1992), who provided a detailed description of its morphology. They indicated that the apparent absence of a close affinity with any of the recognized tribes of Asteraceae suggests that it is a very isolated member of the subfamily.

Cratystylis is a small genus of shrubby dioecious plants, with three named species in Western Australia, one of which extends eastwards across southern Australia. The preparation of an account for the "Flora of Australia" has led us to examine the material in Australian herbaria and in particular to study and re-collect a *Cratystylis* plant that is found in the Northern Territory. The presence in the Northern Territory of a species of *Cratystylis* has been recognised for some years; it was mentioned by Jessop (1981) who suggested that it was an undescribed species closely related to *C. conocephala*, and listed by Dunlop *et al.* (1995) and by Albrecht *et al.* (1997) who referred to it as *Cratystylis* A36062 Glen Helen. A number of collections of this taxon from several localities in the Northern Territory have now been made and it is clear that it differs from the three named species of *Cratystylis*.

In the process of examining herbarium material of the genus it became apparent that specimens identified as *C. microphylla* could be separated into two groups, each with a different type of foliage and capitulum. This observation led to an investigation into the applications of the names *C. microphylla* S. Moore and *Stera microphylla* Ewart & B. Rees, the epithets of both being derived from the same manuscript name of F. Mueller & R. Tate.

The names *Cratystylis microphylla* and *Stera microphylla*

In November (and possibly December) 1891 Richard Helms, the botanist on the Elder Exploring Expedition 1891–1892, made collections of a plant at Lake Lefroy, Western Australia, that was subsequently given the name *Pluchea conocephala* var. *microphylla* by Mueller & Tate (1896), but it was not then formally described. The collections bearing this manuscript name found their way to a number of herbaria including the Royal Botanic Gardens, Kew (K) and the National Herbarium of Victoria (MEL). The specimens at Kew were described by Spencer Moore (1905) under the name *Cratystylis microphylla*, while those in the National Herbarium of Victoria were described by Ewart & Rees (1912) under the name *Stera microphylla*. According to collections seen in BM, K, MEL and PERTH, Richard Helms collected *C. microphylla* at Lake Lefroy on 7 November 1891 and "Near Lake Lefroy" on "12. 91" The latter date, which is written on a printed label attached to a PERTH specimen in pencil, has been interpreted as being December 1891. However, according to a map which accompanied the expedition (Lindsay 1893) and according to a résumé of the itinerary of the expedition by C.M. Eardley (Anon. 1950), all the relevant collections must have been made in November since by December the party was west of Southern Cross which is over 180 km west of Lake Lefroy and well beyond the otherwise recorded distribution of *C. microphylla*.

The description of *C. microphylla* by Spencer Moore refers to the leaves as oblong, obtuse, with a prominent dorsal rib, 1.5–2.5 mm long, appressed to the stem, and refers to the number of florets as 1 or 2. This description agrees with specimens collected by Helms 'near Lake Lefroy' which are mounted on sheet PERTH 01044044, and agrees with one of the two specimens mounted on sheet MEL 249444 that were collected by Helms at Lake Lefroy on 7 November 1891, and with one specimen (the lectotype, see below) of the two mounted on the type sheet, herb. K, except that the number of florets per capitulum appears to be strictly 1 and the leaves are only 1–1.5 mm long. These specimens match those of other collections that come from an area which stretches from near Comet Vale (about 100 km north of Kalgoorlie) south to Norseman. The pappus bristles of these specimens are minutely denticulate or smooth towards the apex.

The description and accompanying illustration of *Stera microphylla* by Ewart & Rees (1912) indicate that the leaves of this taxon are slightly spreading, 2–3 mm long, obovate and obtuse, covered with woolly hairs, and that the capitula are two-flowered. This description agrees with the specimen on sheet MEL 249445 collected by Helms at Lake Lefroy on 7 November 1891, with a duplicate of this collection at BM, with one of the two specimens on sheet MEL 249444, and with the left-hand specimen (excluded syntype) on the type sheet of *Cratystylis microphylla* S. Moore in herb. K. The first of these sheets has been labelled (? by Ewart) '*Stera microphylla* Ewart & Rees' and is accepted as being the holotype of that name.

These specimens that agree with the description and presumed holotype of *Stera microphylla* are intermediate in morphology between the lectotype of *Cratystylis microphylla* and the variant of *C. conocephala* found in the Lake Lefroy–Kalgoorlie area. It is assumed to be a hybrid between these two species. One collector (Arthur Weston, pers. comm.) indicated that the intermediate plant and the putative parents were found growing in the same locality.

It is probable that Moore derived his description of *Cratystylis microphylla* principally from the right-hand specimen on the type sheet in herb. K, which matches the sheet PERTH 01044044 cited above, but he also saw a specimen that matched the material on MEL 249225 (the type of *Stera microphylla*) which is 2-flowered and for this reason described the number of florets as one or two and the leaf size as 1.5–2.5 mm long. *Cratystylis microphylla*, as lectotypified below, corresponds to the plant with 1-flowered capitula and with smaller oblong resinous leaves that are appressed to the stem.

Key to species of *Cratystylis*

1 Plant appressed-villous with medifixed hairs; branchlets spinescent; anthers with long (c. 0.5 mm) tails ..... **C. subspinescens**
1: Plant tomentose, hairs basifixed; branchlets not spinescent; anthers with very short tails to 0.05 mm, or these absent
2 Glandular hairs absent; leaves obovate, spreading, 5–10 mm long; florets (4)5(6) ..... **C. conocephala**
2: Globular sessile glandular hairs obvious; leaves from subterete and appressed to spathulate and spreading; florets 1–4
3 Leaves 1–1.5 mm long, oblong, closely appressed to branch, resinous; capitula 1-flowered ..... **C. microphylla**
3: Leaves 2–6 mm long, elliptic to obovate, not closely appressed to branch, tomentose; capitula 2–4-flowered
4 Capitula 2-flowered; occurring in Western Australia .. ?**C. conocephala** × **C. microphylla**
4: Capitula 3- or 4-flowered; occurring in Northern Territory ..... **C. centralis**

Descriptions

Cratystylis centralis Albr. & Paul G. Wilson, *sp. nov.*

Folia anguste obovata vel spathulata, 3–6 mm longa, patentia, cineraceo lanata et glandibus minutis globulosis ornata. Capitulum anguste turbinatum, c. 10 mm altum, 3 vel 4 florum. Anthera calcarata perbrevibus caudata.

Typus: 2 km west-north-west of Glen Helen, West MacDonnell National Park, Northern Territory, 16 October 1997, *M.J.A. Barritt* 3000 (*holo:* DNA (A95428); *iso:* PERTH 05538882).

Much branched, brittle, greyish *shrub* to 1 m high. *Leaves* spreading, fleshy, narrowly obovate to spathulate, 3–6 mm long, covered with small globular glands and a thin greyish woolly tomentum. *Capitula* solitary, terminal on branchlets, 3- or 4-flowered. *Involucre* narrowly turbinate, 7–10 mm long; involucral bracts cartilaginous, woolly ciliate, resinous and shortly tomentose towards the apex, outer ones ovate, *c.* 2 mm long, inner ones narrowly oblong, *c.* 8 mm long, eventually spreading. *Corolla* glabrous, white, tube narrowly cylindrical, *c.* 4.5 mm long; lobes erect, narrowly triangular, *c.* 2 mm long. *Anthers* calcarate and very shortly tailed. *Style arms* in male flower appressed, in female flower spreading, linear, 1–2 mm long, obtuse to acute. *Cypsela* narrowly cylindrical, *c.* 3 mm long, finely ribbed. *Pappus bristles* shortly plumose below, densely barbellate towards apex, *c.* 3/4 length of corolla. (Figure 1A–C)

Other specimens examined. NORTHERN TERRITORY: 4 km WSW of Mt Sonder, *D.E. Albrecht* 8845 (DNA, PERTH); Tylers Pass, 23°39'S, 132°40'E, *G. Griffin* 108 (DNA); Mt Peachy, 24°18'S, 133°52'E, *G. Griffin s.n.* (DNA); Mt Laughlan foothills, North Garden Station, 23°20'S, 134°25'E, *G. Griffin s.n.* (DNA); Waterhouse Range, 24°02'S, 133°28'E, *G. Griffin s.n.* (DNA); 8.4 km from Arltunga on Paddy's Plain, 23°28'S, 134°36'E, *M. Heywood* 1 (DNA); 4.25 km SSE of Top Well near Garden Homestead, 23°00'S, 134°08'E, *M. Heywood* 199 (DNA); Tylers Pass, *P.K. Latz* 10263 (DNA, MEL); Mt Riddock Station, 23°01'S, 134°32'E, *P.K. Latz* 3156 (DNA); Hermannsburg Station, 23°42'S, 132°21'E, *P.K. Latz* 6740 (DNA, AD, NSW, K); *c.* 4 km S of Alkara Bore, Mt Riddock Station, 22°35'S, 135°26'E, *B.W. Strong* 779 (DNA); 2 km W of Glen Helen, 23°40'S, 132°38'E, *B.G. Thomson* 3566 (DNA).

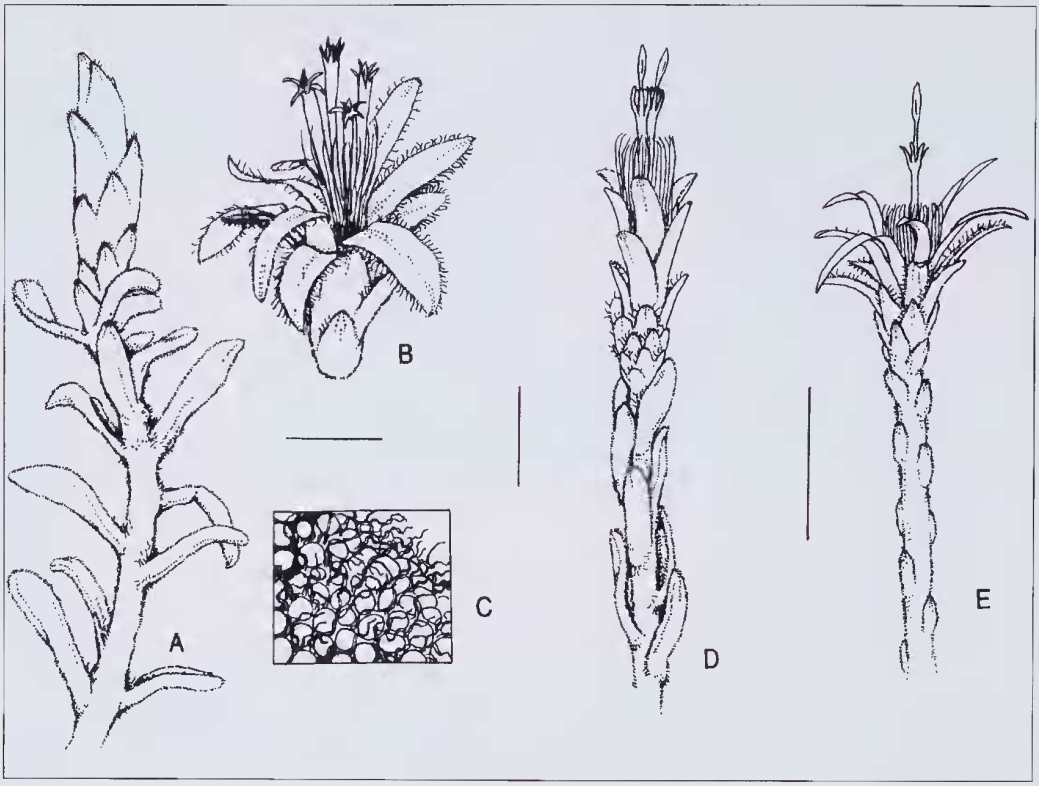

Figure 1. A–C. *Cratystylis centralis*, drawn from *B.W. Strong* 779 (DNA). A – flowering braneh; B – male capitulum; C – leaf indumentum (x 100); D – ?*Cratystylis conocephala* x *C. microphylla*, flowering branch, male, drawn from *A. Chapman* 5/91 (PERTH); E – *Cratystylis microphylla*, flowering branch, male, drawn from *L.A. Craven* 7466 (PERTH). Scale bars all 0.5 mm.

Distribution. Northern Territory, where known from relatively few populations within a radius of *c.* 200 km of Alice Springs. (Figure 2)

Habitat. Confined to breakaway country and similar pallid eroding areas. Soils have been tested at only one site where they were found to have extremely elevated salinity levels and a ph of 7.5. Populations east of Alice Springs are typically found growing with *Eucalyptus thozetiana*, *Acacia georginae*, *Eremophila dalyana*, or *Ptilotus parvifolius*. To the west of Alice Springs associated species include *Ptilotus parvifolius*, *Sclerolaena* spp., and *Frankenia cordata*.

Flowering period. The peak flowering period is between August and November. Flowering outside this period appears to be uncommon with a single flowering specimen collected in April.

Conservation status. Albrecht *et al.* (1997) considered that a conservation code of 3RC is appropriate because there are few populations and most of these are small. It is poorly reserved with only two localised populations, each with fewer than 100 plants, known within the West Macdonnell National Park.

Etymology. The epithet is the Latin word for centre and alludes to the presence of this species in Central Australia.

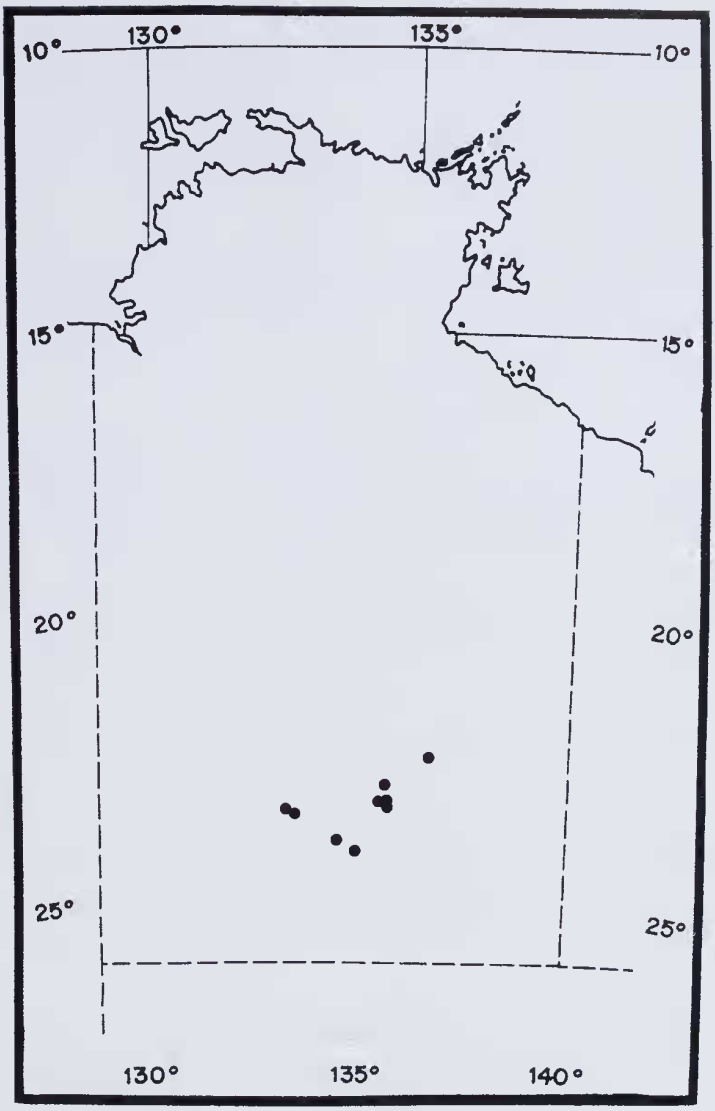

Figure 2. Distribution of *Cratystylis centralis*.

Notes. A vegetative collection (*R.J. Cranfield* 6854, PERTH) of a *Cratystylis* species from Barwidgee Station, *c.* 80 km south-east of Wiluna, Western Australia, has similar foliage to *C. centralis* but since it bears no flowers its precise taxonomic position cannot be determined.

Cratystylis centralis has a woolly indumentum and globular glands on the leaves, and there are 3 or 4 flowers per capitulum. In the possession of these characters and in leaf shape it is intermediate between *C. microphylla* and *C. conocephala*. It is treated as a distinct species because neither of the other two species is found in the Northern Territory while the former is restricted to a relatively small area north and south of Kalgoorlie. In addition *C. centralis* shows little morphological variability across its geographic range despite populations being separated by 100 km or more.

Cratystylis conocephala (F. Muell.) S. Moore, *J. Bot.* 43: 138 (1905). – *Eurybia conocephala* F. Muell., *Trans. & Proc. Vict. Inst. Advancem. Sci.* 36 (1855). – *Aster conocephala* (F. Muell.) F. Muell., Fragm. 5: 79 (1865). – *Olearia conocephala* (F. Muell.) Benth., Fl. Austral. 3: 480 (1867). – *Pluchea conocephala* (F. Muell.) F. Muell., *Bot. Centralbl.* 32: 150 (1887). – *Stera conocephala* (F. Muell.) Ewart & B. Rees, *Proc. Roy. Soc. Victoria* ser. 2, 24: 264 (1912). *Type:* Murray River, South Australia, October 1848, *F. Mueller* (*lecto:* MEL 248222, lectotype here designated).

Pteronia australiensis J. Hutchinson, *Biol. Meddel. Kongel. Danske Vidensk. Selsk.* 3: 131 (1921). *Type:* Kalgoorlie, Western Australia, 7 October 1914, *C.H. Ostenfeld* 858 (*iso:* PERTH 01044036).

Densely branched *shrub* to 1.5 m high. *Leaves* obovate, obtuse to rounded, cuneate at base, 5–10 mm long, leathery, woolly tomentose, not resinous. *Capitula* (4)5(6)-flowered. *Pappus bristles* shortly plumose.

Distribution. Occurs in south-eastern Western Australia, southern South Australia, far south-western New South Wales, and far north-western Victoria. In Western Australia the species extends from the Kalgoorlie–Ravensthorpe area eastwards.

Habitat. Usually found growing in mallee woodland on calcareous soil.

Note. According to Keighery (1984), in Western Australia female plants usually predominate in a population by about 6:1.

? Cratystylis conocephala (F. Muell.) S. Moore × **C. microphylla** S. Moore

Stera microphylla Ewart & B. Rees, *Proc. Roy. Soc. Victoria* ser. 2, 24: 264, t. 55 fig. b (1912). *Type:* Lake Lefroy, Western Australia, 7 November 1891, *R.Helms* (*holo:* MEL 249445; *iso:* BM).

[*Cratystylis microphylla* S. Moore, *J. Bot.* 43: 139 (1905), *p.p.*, as to left-hand specimen on type sheet in herb. K, not as to lectotype]

[*Pluchea conocephala* var. *microphylla* F. Muell. & Tate, *Trans. & Proc. Roy. Soc. South Australia* 16: 365 (1896) *p.p.*, *nom. nud.*]

Rounded *shrub* to 0.5 m high. *Leaves* elliptic to obovate, 2–4 mm long, erect to somewhat spreading, tomentose, with globular sessile glandular hairs. *Capitula* 2-flowered. *Pappus bristles* very shortly plumose to the apex. (Figure 1D)

Other specimens examined. WESTERN AUSTRALIA: 5 km E of Norseman, *P.G. Wilson* 6044 *bis* (PERTH); 30 km SSW of Coolgardie, *A. Chapman & G. Landwehr* 5/91 (PERTH); Three Mile Hill, Coolgardie, *J. Bale* 44 (PERTH).

Distribution. Found between Coolgardie and Norseman, Western Australia.

Notes. Specimens are intermediate in morphology between *C. microphylla* and *C. conocephala* and one botanist has noted (see above) that the putative parents were observed at the same site as the presumed hybrid.

Cratystylis microphylla S. Moore, *J. Bot.* 43: 139 (1905). *Type:* Lake Lefroy, Western Australia, *R. Helms* (*lecto:* K, right-hand specimen on sheet, lectotype here designated; *isolecto:* PERTH 01044044).

[*Pluchea conocephala* var. *microphylla* F. Muell. & Tate, *Trans. & Proc. Roy. Soc. South Australia* 16: 365 (1896) *p.p.*, *nom. nud.*]

Densely branched *shrub* to 1 m high. *Leaves* congested, erect and appressed to branch, semiterete, 1–2 mm long, finely grey-tomentose, resinous. *Capitula* 1-flowered. *Pappus bristles* sparsely denticulate or smooth towards apex. (Figure 1E)

Distribution. Found from *c.* 100 km north of Kalgoorlie south to Norseman in Western Australia.

Habitat. Grows in yellow sandy loam, which is often saline or calcareous.

Note. In about half of the herbarium specimens of *C. microphylla* some or all the florets are galled. In these florets the corolla does not form and the pappus is replaced by lanceolate scales that are similar in texture to the cartilaginous involucral bracts.

Cratystylis subspinescens S. Moore, *J. Bot.* 43: 139 (1905). *Type:* near Hunt's Well, Western Australia, *R. Helms* (*holo:* K *n.v.*).

Stera subspinescens Ewart & B. Rees, *Proc. Roy. Soc. Victoria* ser. 2, 24: 265, t. 55 fig. c (1912). *Type:* Lake Lefroy, Western Australia, December 1891, *R. Helms* (*n.v.*).

[*Pluchea conocephala* var. *subspinescens* F. Muell. & Tate, *Trans. & Proc. Roy. Soc. S. Australia* 16: 365 (1896), *nom. nud.*]

Rounded divaricately branched grey *shrub* to 1 m high; branchlets spinescent, appressed-villous. *Leaves* spreading, narrowly elliptic to narrowly spathulate, 3–12 mm long, appressed-villous with medifixed hairs. *Capitula* 3–6-flowered. *Pappus bristles* scabrid.

Distribution. Found in semi-arid areas of Western Australia from the central west coast at Point Quobba south-east to Norseman and Plumridge Lake.

Habitat. Associated with calcareous or saline soil and frequently found around salt lakes. Sometimes forming a dominant cover in saltbush steppe (Keighery 1984).

Acknowledgements

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